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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/683,795	02/15/2002	Frank Olschewski	21295/41	5943

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EXAMINER

SEALEY, LANCE W

ART UNIT	PAPER NUMBER
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2671

DATE MAILED: 12/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/683,795

Applicant(s)

OLSCHEWSKI ET AL.

Examiner

Lance W. Sealey

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 and 9-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12-18 is/are allowed.
- 6) ☒ Claim(s) 1-2, 4-7 and 9-10 is/are rejected.
- 7) ☒ Claim(s) 3 and 11 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☒ Interview Summary (PTO-413) Paper No(s). 11.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3. 6) ☐ Other:

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SUPPLEMENTAL ACTION

1. This action is responsive to the amendment of 15 October 2003 and serves to withdraw the final rejection of 31 December 2003.

Allowed and Allowable Subject Matter

2. Claims 12-18 are allowed, and claims 3 and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. No prior art anticipates or suggests a method for imaging and measuring microscopic three-dimensional structures, wherein upon definition of the rotation angle, a transformation matrix is calculated, and upon definition of the section position, corresponding section planes are calculated and sectional geometry is implemented in the form of a wire-frame model made up of an outer and an inner cuboid (claim 3); wherein the selected volume represents a three-dimensional curve; and a scanning microscope is controlled in such a way that only points on the three-dimensional spatial curve are scanned (claim 11); a (separate) second window shown on the display for depicting a rotational view, and a (separate) third window shown on the display for a visual depiction of the coordinates, the rotation angle, and a section position (claim 12). The word “(separate)” has been added by the examiner only to more specifically emphasize what is not being taught by the cited reference; the word “separate” is not part of claim 12. Claims 13-18 are allowed because they depend, directly or indirectly, from claim 12.

Claim Rejections - 35 USC § 103

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3. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-2 and 6-7 are rejected under 35 U.S.C. 103(a) as unpatentable by Hellmuth et al. ("Hellmuth," U.S. Pat. No. 5,795,295) in view of Demandolx et al., "Multicolour analysis and local image correlation in confocal microscopy" ("Demandolx").

5. Hellmuth, in disclosing an oct-assisted surgical microscope with multi-coordinate manipulator, also discloses, with respect to claim 1, a method for imaging and measuring microscopic three-dimensional structures comprising:

- depicting a data set in three-dimensional form on a display associated with a microscope (col.8, ll.13-24: brain 1000, FIG.1 is three-dimensional, inherent that before the three-dimensional portion of brain appears on the display, it is stored in a data set);
- defining at least one arbitrary section position and an arbitrary rotation angle (col.11, ll.38-43: In order for the OCT scan data of the brain to be displayed at a certain position on video monitor 210, FIG.1, its "arbitrary section position" must be defined. The arbitrary rotation angle is any of the "angles or orientation of the planes" in col.11, ll.38-39);
- rotating the three-dimensional depiction on the display until a structure contained

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in the three-dimensional form reproduces on the display a depiction that appears suitable to the user for further processing (col.11, ll.25-30); and

- performing an analytical measurement operation on the structure (col.14, ll.57-65 state that the resulting correlation function $A(I,J)$ has a maximum value at (row, column) given by (I_{\max}, J_{\max}) , which maximum value corresponds to the best fit between the binary OCT scan data set and the binary diagnostic image data set. The distances between diagnostic image data is known. As a result, the offset between the OCT scan data and the diagnostic image data is $s \cdot I_{\max}$ in the x-direction and $s \cdot J_{\max}$ in the y-direction. The displacement values are then used to shift the diagnostic image data to its true position.

Therefore the offset (length measurement) between the OCT scan data (structure) and the diagnostic image data is shifted to its true position based on (analysis of the offsets.) and

- at least one obliquely oriented plane or a set of discrete points is determined in a volume, the at least one obliquely located plane determined or selected by way of a corresponding graphical drawing tool or an automatic drawing function, the obliquely oriented plane marked with a continuous line at col.10, ll.26-55, especially ll.52-55 (In the "wherein at least one obliquely oriented plane or a set of discrete points is determined in a volume" limitation, if art is found that discloses a set of discrete points determined in a volume, then the rest of claim 8, the part that reads "at least one obliquely located plane is determined or selected by way of a corresponding graphical drawing tool or an automatic function, and the obliquely oriented plane is marked with a continuous line" can be disregarded. The discrete set of points in the volume are the points of orientation in the OCT scan planes in the volume.).

6. However, Hellmuth does not disclose a confocal scanning microscope. This element is disclosed by the Demandolx article at the second column of p.21, first full paragraph.

7. Therefore, it would have been obvious to one of ordinary skill in the art to have modified the Hellmuth microscope in view of the Demandolx microscope. Such a modification to

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Hellmuth allows for 3D sampling of specimens while excluding out-of-focus blur (Demandolx, p.21, second column, first full paragraph).

8. Hellmuth further discloses, with respect to claim 2, corresponding section planes calculated upon definition of the section position (col.11, ll.38-43), and calculation of a transformation matrix upon definition of the rotation angle at col.14, ll.39-48.

9. Concerning claim 6, Hellmuth discloses at least one length to be measured is determined in an imaged volume, the length being defined by a first and a second position and the geometric distance between the two positions representing the desired length (col.13, ll.6-37, especially ll.33-37, where a radius of a circle denoting a critical point in a human brain for a neurosurgeon is defined. The three-dimensional portion of the human brain is assumed to be stored in an imaged volume, the first and second positions are the points at either end of the radius, and the length to be measured is the length of the radius.).

10. Regarding claim 7, Hellmuth discloses a user marking two positions established and marked as a result of navigating into a plane and a PC calculating and visualizing the geometric distance between the two positions (col.13, ll.6-37, especially ll.33-37, where a radius of a circle denoting a critical point in a human brain for a neurosurgeon is defined by the user neurosurgeon with a light pen. The first and second positions are the points at either end of the radius, and the length to be measured is the length of the radius.).

11. Therefore, in view of the foregoing, claims 1-2 and 6-7 are rejected as being unpatentable under 35 U.S.C. 103(a) by Hellmuth in view of Demandolx.

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12. Claims 4 and 5 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hellmuth and Demandolx and further in view of Banitt (U.S. Pat. No. 5,963,247) and Lemelson (U.S. Pat. No. 6,400,980).

13. With respect to claim 4, Hellmuth further discloses an “orthosectioning” view assembled in a first window (video monitor **210**, FIG.1) from multiple images each with a different viewing direction (different directions: col.11, ll.25-30; multiple images: col.11, ll.35-38).

14. However, neither Hellmuth nor Demandolx disclose the images lined up with each other at the corresponding edges; this element is disclosed by the Banitt visual display system in FIG.2A.

15. Therefore, it would have been obvious to one of ordinary skill in the art to have modified the Hellmuth-Demandolx microscope apparatus in view of the Banitt display. Such a modification to Hellmuth-Demandolx enhances the effect of three-dimensionality (Banitt, col.11, ll.24-33).

16. However, neither Hellmuth, Demandolx nor Banitt disclose crosshairs indicating the current position of the images; this element is disclosed by the crosshairs in the Lemelson display at col.6, ll.50-56.

17. Therefore, it would have been obvious to one of ordinary skill in the art to have modified the Banitt display in view of the Lemelson display. Such a modification to Banitt facilitates use of the display (Lemelson, col.6, ll.50-52).

18. Concerning claim 5, neither Hellmuth, Demandolx nor Banitt disclose the position of the

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images modified interactively by way of the crosshairs by manipulation by means of an input device such that in the individual regions, the images are updated during modification and the image content is modified accordingly. However, these elements are taught by Lemelson.

Lemelson discloses the position of the images modified interactively by way of the crosshairs by manipulation by means of an input device (col.6, ll.50-52), such that in the individual regions (taught by Hellmuth), the images are updated during modification and the image content is modified accordingly.

19. Therefore, it would have been obvious to one of ordinary skill in the art to have modified the Banitt display in view of the Lemelson display. Such a modification to Banitt facilitates use of the display (Lemelson, col.6, ll.50-52).

20. Accordingly, in view of the foregoing, claims 4 and 5 are rejected as being unpatentable under 35 U.S.C. 103 by Hellmuth, Demandolx, Banitt and Lemelson.

21. Finally, claims 9-10 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hellmuth in view of Demandolx and further in view of Rittman, III et al. ("Rittman", U.S. Pat. No. 6,575,969).

22. Neither Hellmuth nor Demandolx disclose, with respect to claim 9, multiple surfaces assembled into a stack that represents a three-dimensional volume, and specific analyses performed on the volume. These elements are disclosed by the Rittman cool-tip radio frequency thermosurgery electrode system for tumor ablation. The stack is disclosed at col.18, ll.9-19, and the analyses are disclosed at col.18, ll.18-26.

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23. Therefore, it would have been obvious to one of ordinary skill in the art to have modified the Hellmuth-Demandolx microscope apparatus in view of the Rittman apparatus. Such a modification to Hellmuth-Demandolx would aid in locating tumors (Rittman, col.18, ll.18-26).

24. The other claim in this rejection will now be considered. Concerning claim 10, Rittman discloses scan parameters applied exclusively to the selected volume (scan parameters="criterion" in col.18, ll.19-20).

25. Therefore, it would have been obvious to one of ordinary skill in the art to have modified the Hellmuth-Demandolx microscope apparatus in view of the Rittman apparatus. Such a modification to Hellmuth-Demandolx would aid in locating tumors (Rittman, col.18, ll.18-26).

26. Accordingly, in view of the foregoing, claims 9-10 are rejected as being unpatentable under 35 U.S.C. 103 by Hellmuth, Demandolx and Rittman.

Response to Remarks

27. The applicants incorporated the former claim 8 into the present claim 1 based on the examiner's statement in the last Office action that the former claim 8 was allowable.

28. However, as alluded to in the interview of 4/2/04, in the "wherein at least one obliquely oriented plane or a set of discrete points is determined in a volume" limitation, if art is found that discloses a set of discrete points determined in a volume, then the rest of that claim limitation, the part that reads "at least one obliquely located plane is determined or selected by way of a corresponding graphical drawing tool or an automatic function, and the obliquely oriented plane is marked with a continuous line" can be disregarded.


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Conclusion

Any inquiry concerning this communication or earlier communications from the Office should be directed to the examiner, Lance Sealey, whose telephone number is (703) 305-0026. He can be reached from 7:00 am-3:30 pm Monday-Friday EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Zimmerman, can be reached at (703) 305-9798.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


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